

FLIGHT

The
**AIRCRAFT
ENGINEER
&
AIRSHIPS**

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport
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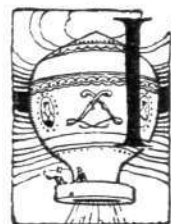
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EDITORIAL COMMENT.



IN spite of its statistical character the annual report of the Director of Civil Aviation is always a most interesting document, the dryness of its tables being relieved by a considerable amount of explanatory matter. The report covering the period April 1, 1923, to March 31, 1924, is no exception to this rule, and is, if anything, of even greater interest than previous reports. For one thing, finishing as it does at the date on which the four air line companies ceased to work as independent firms and became merged into one, known as Imperial Airways, Ltd., this year's report, a brief *résumé* of which is published elsewhere in this issue of FLIGHT, carries us up to what may be termed the "peak" of civil aviation as hitherto operated in this country. The next report will, of course, deal with the first year's operation by Imperial Airways, Ltd., and will therefore form an interesting means of comparison between independent and monopoly operation.

A fact which also adds considerably to the value of this year's report is the addition, for the first time, of statistics dealing with civil flying accidents. Hitherto these have not been included in the annual report of the D. of C. A., but in the introduction to the report it is stated that "It is considered that the publication of details of the work carried out by the Inspector of Accidents in conformity with these regulations is beneficial to the growth of an informed public opinion in regard to civil flying accidents."

As regards the work of the regular subsidised air lines the progress has, it will be seen, been steady if somewhat slow, and 1,004,000 miles have been flown by the companies in 5,012 flights, as against 778,000 miles in 4,000 flights during the previous year. Apart from the extra mileage flown it will be seen that the average length of each flight has very slightly increased, being 200 miles for the present year as against 194 for the previous period. A similar increase in the number of passengers and quantity of goods carried is to be noted, and it is satisfactory to find that British firms have continued to carry the greater proportion of the traffic.

DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list:—

1924

- Aug. 22** Entries Close at Ordinary Fees for Light 'Plane Competition at Lympne.
- Sept. 5** Entries Close at Double Fees for Light 'Plane Competition at Lympne.
- " 27-28** Eliminating Tests for Light 'Plane Competition at Lympne.
- " 27-**
- Oct. 8** Wireless Exhibition at Albert Hall, Kensington.
- Sept. 29-**
- Oct. 4** 2-Seater Light 'Plane Competition at Lympne.
- Oct. 2** Aero Golfing Society. Autumn Meeting, at Moor Park Golf Club, for A.G.S. Challenge Cup presented by Cellon (Richmond) Ltd.
- " 4** Grosvenor Challenge Cup Race at Lympne.
- October** Schneider Cup Race, Baltimore.
- Dec. 5-21** Paris Aero Show.

It is, perhaps, under the sections dealing with the work of unsubsidised companies that the most interesting information is to be found, and perusal of the figures indicates that here also progress has been satisfactory. Particularly noteworthy is the work done by the De Havilland Hire Service, which has flown over 165,000 miles without a single serious mishap. Such figures speak for themselves.

Under the section dealing with technical services some very promising statements are made concerning new types of machines. These although in most cases not accomplished facts, appear to indicate a real determination to effect practical improvements in the types of machines used for specialised purposes, and if the Treasury can be convinced of the necessity for continued support considerable progress should be made.

In the matter of accidents it is interesting to find that out of 26 serious mishaps 13 or 50 per cent. were due, or at any rate are ascribed to errors of judgment on the part of the pilots; 2 only were due to defect in the aircraft or controls; 8 to engine defects; 1 to weather conditions; and 2 to other causes. The fact that 50 per cent. should be ascribed to error of judgment on the part of the pilot seems to show that there is considerable room for improvement in the machines themselves so as to lessen the consequences of what may have been, and probably was in most cases a very slight mistake. Prevention of stalling, or if that be impossible, designs which will allow the machine to get out of the stall after a very short drop, seems to be the first desideratum to be aimed at, and already there is reason to believe that much can be done in this direction. Engine failure (which may be due to the engine itself, but is probably in more cases due to installation of an accessory detail) is responsible for 8 out of 26, and is therefore, the next in "order of merit." A perusal of the reasons given for some of the failures dealt with shows that in most cases the causes were of a

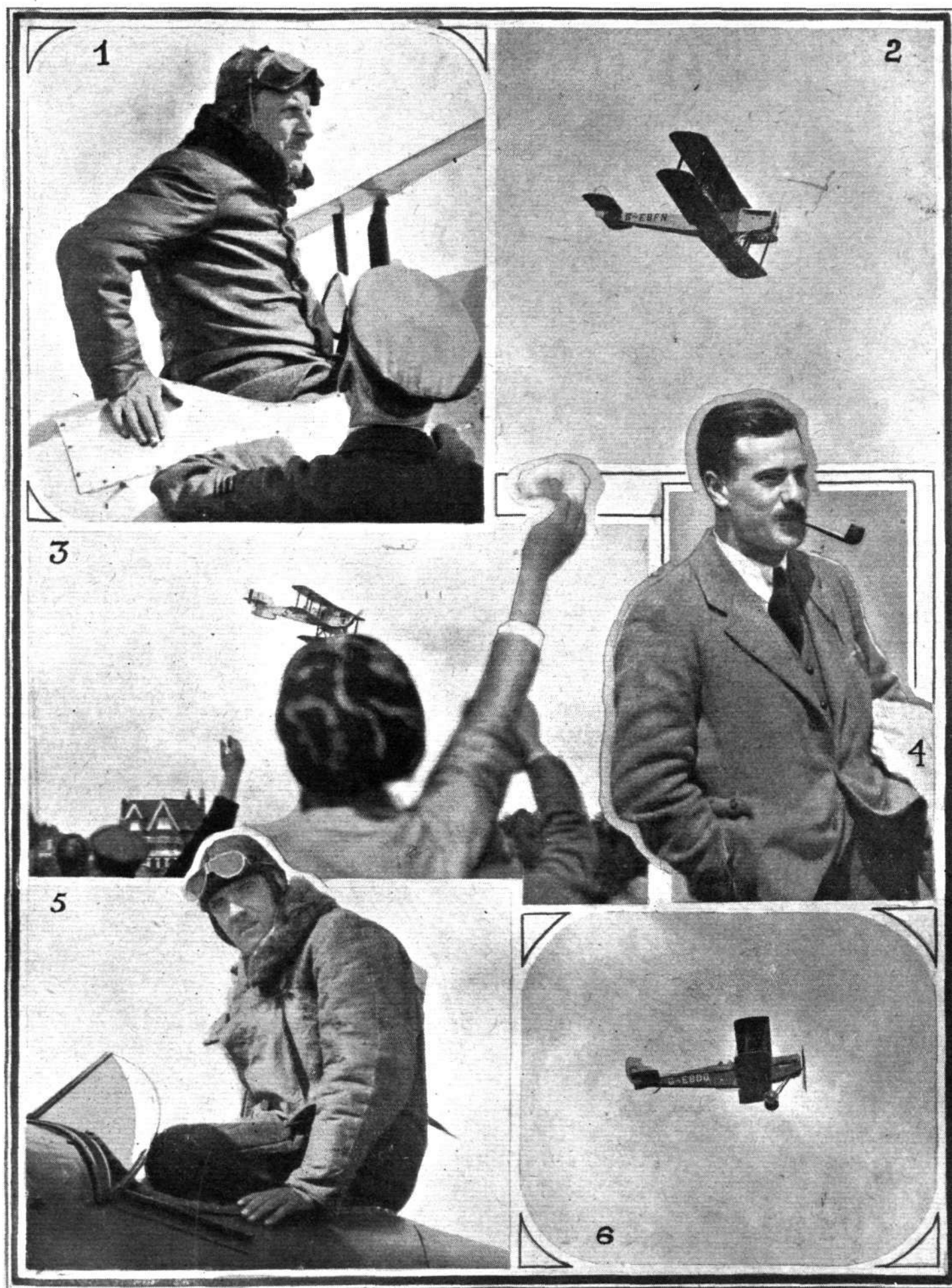
trivial nature, and should be avoidable. Apart from improvements in the engines themselves and their installation the official remedy suggested appears to be the adoption of three-engined machines, capable of flying on two engines only. So far experiments have been insufficient to form any very clear opinion on this point, but it seems probable that three-engined machines are unlikely to be as efficient as single-engined or twin-engined types.

The King's Cup Race

In spite of the somewhat unfortunate scheme for this year's race around Britain for the Challenge Cup presented by His Majesty the King, the race aroused very considerable interest, and was, it is thought, watched at the various turning points, as well as at the start and finish, by very considerable numbers. That only six out of the ten machines entered should have got through seems a little unfortunate, but it will be seen that most of the causes are of that annoying petty nature which so often go to upset the most elaborate organisation. Propeller trouble was the cause of two retirements from the race, the propeller in one case coming off in the air, while in another the spinner burst. This seems to be a quaint habit which spinners have, and it really begins to look as if, assuming it is impossible to design a spinner that will "stay put," the fitting of this accessory is of doubtful value. One machine was eliminated by the collapse of its under-carriage, but at present we are not aware whether this was due to a bumpy landing or to a defect in the structure. The fourth mishap is ascribed to the machine running into a haystack on landing, and is one of the minor mishaps that might occur to anyone. Altogether there have been no failures which are likely to be repeated, nor do they in the least detract from the reliability of aircraft as such. The circuit of Britain was a strenuous one, carried out on a variety of types, and carries with it its own lessons.



THE RACE ROUND BRITAIN FOR THE KING'S CUP: Lord Thomson, Secretary of State for Air, has an informal chat with Lord Montagu of Beaulieu at the Gosport aerodrome whilst waiting for the homing of the competitors.



FIRST, SECOND AND THIRD IN THE KING'S CUP RACE: 1, Mr. A. J. Cobham getting out of his D.H.50 (Siddeley "Puma") after winning the race. 2, Cobham, crossing the finishing line. 3, Capt. Norman Macmillan crossing the finishing line on his Fairey III.D (Napier "Lion"). 4, Capt. Macmillan, complete with pipe. 5, Mr. A. S. Butler alighting from his D.H.37 (Rolls-Royce "Falcon") after having secured third place in the race. 6, Mr. Butler crossing the finishing line.



THE Third King's Cup Air Race Round Britain, which took place on Tuesday last, August 12, was a vastly different affair compared with the two previous races. In former years, one was in constant touch, as it were, with the progress of the race throughout the two days during which it was run, and some thousands of spectators were able actually to witness this progress at various stages of the course. This time, however, once the competitors had started—and they were all away within a few minutes—it seemed as if we lost all touch with the various pilots and machines for a few brief hours,

and then at intervals spread over a period of $1\frac{1}{2}$ hours those that remained in the race arrived "Home," and after some simple calculations the race was all over! Nevertheless, from a technical point of view, it was not altogether uninteresting, and the performances put up by the "survivors" were certainly noteworthy.

This year's winner—undoubtedly a popular one—was Alan J. Cobham, of "aerial taxi" fame, who was flying a D.H. 50 biplane (230 h.p. Siddeley "Puma") entered by Sir Charles Wakefield. He completed the 950-mile course in 8 hrs. 57 mins.



THE FASTEST MACHINE IN THE KING'S CUP RACE: The two photographs on the left show the Armstrong-Whitworth "Siskin," which was fourth under the handicap, crossing the finishing line, and, below, alighting on the Gosport aerodrome. On the right Flight-Lieut. Jones getting out of his machine.

THE KING'S CUP AIR RACE ROUND BRITAIN.

August 12, 1924.

PROGRESS OF RACE.

Ident.	Mark.	Entrant.	Pilot.	Machine.	Engine.	Handicap.	Turned at Leith.	Turned at Dumbarton.	Turned at Falmouth.	Art. Lee- on-Solent.	Flying Time.	Net Time.	Final Placing.
1	..	Commander James Bird and H. T. Vane	Capt. H. C. Biard	..	Supermarine "Seagull"	450 Napier "Lion."	h. m. s.	h. m.	h. m.	h. m. s.	h. m. s.	h. m. s.	..
2	..	Godfrey L. Wood and Capt. Leigh Mossley	Colonel the Master Sempill	..	of Supermarine "Seagull"	450 Napier "Lion."	3 32 0	10 17	5 10	6 38 43	13 0 43	9 28 43	6
G-EBFN	..	Sir Charles Wakefield, Bart.	Alan J. Cobham	..	D.H.50	230 Siddeley "Puma."	3 4 12	9 5	1 13	2 33 12	8 57 12	5 53 0	1
G-EBFP	..	Mrs. Theodore Instone	F. L. Barnard	..	D.H.50	230 Siddeley "Puma."	3 1 30	9 4	..	..	..	..	..
3	..	C. R. Fairey	Capt. N. Macmillan	..	3-D Seaplane	450 Napier "Lion."	2 29 12	9 2	12 53	2 15 53	8 45 53	6 16 41	2
G-EBDK	..	G. Le Champion	J. King	..	Martinsyde F.6	200 Wolseley "Viper."	2 13 0	..	..	..	..	..	..
G-EBDO	..	Alan S. Butler	Alan S. Butler	..	D.H. 37	275 Rolls-Royce "Falcon."	2 6 0	8 22	12 43	1 58 48	8 25 40	6 19 41	3
G-EBIP	..	Douglas Vickers	H. J. Payn	..	Vickers "Vixen III"	450 Napier "Lion."	1 17 12	8 3	12 16	2 26 1	8 54 1	7 36 49	5
G-EBJQ	..	Sir Glynn Hamilton	Ft.-Lt. H. W. G. Jones	..	Siddeley Siskin III	325 Siddeley "Jaguar."	Scratch	8 16	11 59	1 5 12	7 34 12	7 34 12	4
G-EBJS	..	J. D. Siddeley..	Frank Courtney	..	Siddeley Siskin III	325 Siddeley "Jaguar."	Scratch	..	..	..	..	..	..

12 secs. flying time, or at an average speed of 106.66 m.p.h. The one and only seaplane in the race, the Fairey III. D (450 Napier "Lion"), entered by Mr. C. R. Fairey and piloted by Capt. Norman Macmillan of World-Flight fame, had the honour of securing second place. Macmillan's flying time was 8 hrs. 45 mins. 53 secs., and his average speed 108.96 m.p.h. Third place was obtained by another favourite—Alan S. Butler on his D.H. 37 (275 h.p. Rolls-Royce "Falcon"), who completed the course in 8 hrs. 28 mins. 37 secs. flying time, at an average speed of 112.65 m.p.h. We would refer our readers to the accompanying table for further details as to times, etc., of the various competitors.

It may be as well to explain here, before we proceed with our report on the race, the main character of this year's King's Cup Race. It was a handicap race, open to both aeroplanes and seaplanes. There were no controls, competitors being started all together (aeroplanes from Martlesham Heath and the seaplane from Felixstowe, but they had to round turning points situated at Leith, Dumbarton and Falmouth, and finish at Lee-on-Solent—the total distance of this course measuring approximately 950 miles. Competitors could alight when and where they liked.

Turning now to the actual race. Out of a total of ten starters six completed the course—and it is of interest to note that half the number of actual starters also finished on the occasion of both previous King's Cup races. In spite of the fact that the start was timed for 5.30 a.m., when darkness was still lingering around, quite a large number of spectators turned up at Martlesham to see the machines off. True, they mostly consisted of aviation enthusiasts, and those directly connected with aviation. However, they numbered some two or three thousand, and arrived by car, cycle and foot, and included Lord Thomson, Secretary of State for Air, Mr. Leach, Under-Secretary of State for Air (who had flown to Martlesham to see the start), and Col. Edwards, representing the Air Ministry. One familiar face was absent, however, and without it the proceedings seemed incomplete—we refer to Sir Sefton Brancker, who was prevented from being present by a broken ankle.

By 5.30 a.m. everything was ready for the start, and one by one each machine got away within a minute or so of each other. Courtney, on the Siskin III—which seemed to be supported on two large petrol tanks!—was the first away, and after climbing to a good height made off over the sea to the N.E. The other two petrol tanks, carried by a Siskin III, piloted by Flight-Lieut. H. W. G. Jones, followed Courtney by about a minute, then H. J. Payn on the Vickers Vixen (450 h.p. Napier "Lion") got away, followed a minute later by Alan S. Butler, on his handsome D.H. 37 (275 h.p. Rolls-Royce "Falcon"). One minute later J. King, on Raynham's old Martinsyde F.6 (200 h.p. Wolseley "Viper") which was entered by Mr. G. Le Champion, started off, followed by F. L. Barnard—the winner of the First King's Cup—on a D.H. 50 (230 Siddeley "Puma") which carried sufficient fuel to take him over the whole 950 miles without a stop. Alan J. Cobham's D.H. 50 (Siddeley "Puma") took off next, one minute later, and from the cheers it appeared he was a hot favourite. The two Supermarine Amphibian flying boats (450 h.p. Napier "Lions") were the last to depart. Biard got away first, making a wide turn to the right, while the Master of Sempill on the second "Seagull" made a wide turn to the left, and was soon lost to sight. The Fairey III D seaplane had in the meantime, started off from Felixstowe near by.

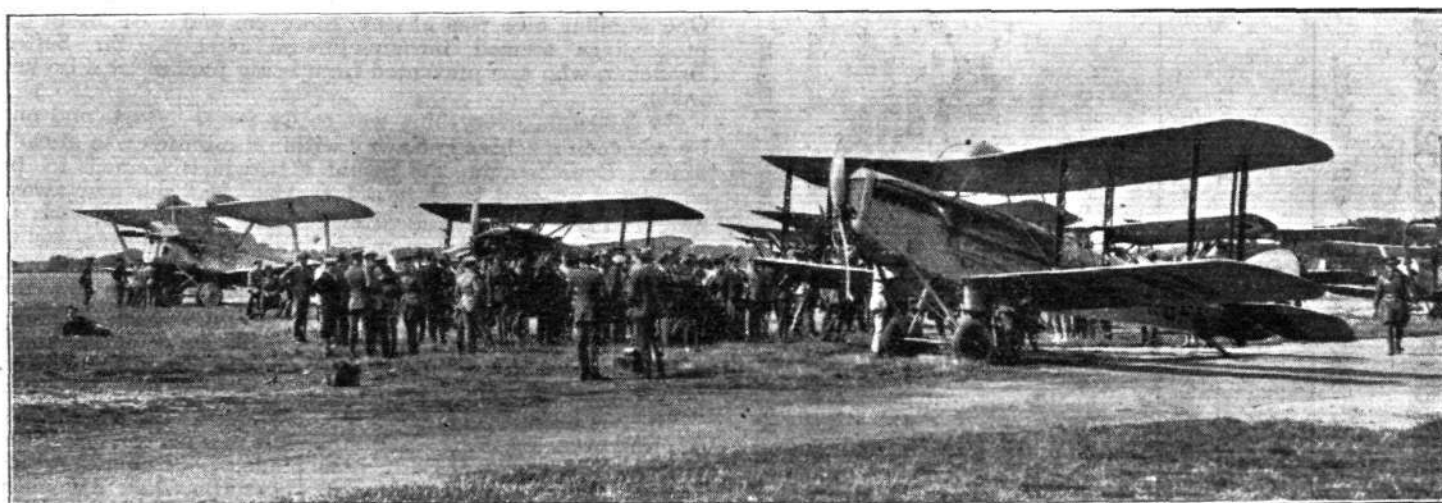
The weather conditions at the start were ideal, there being very little wind, and only a slight haze, usual at this time of the morning. By the time all the competitors were well on their way, however, weather conditions settled down to "low clouds and poor visibility," and following a true course was not an easy matter.

As soon as all the competitors had got away, many of the spectators at once made for Lee-on-Solent for the finish—Lord Thomson and Mr. Leach leaving by air, *via* Stag Lane.

We will now follow the competitors round the course. The first to turn at Leith was Flight-Lieut. Jones on one of the Siskins, his time of passing being 7.50 a.m., and at 8.8 a.m. Payn on the Vickers "Vixen" turned the mark. There was an interval of 14 minutes before the third man came by, this being Alan Butler on the D.H.37. At 8.34 a.m. three machines rounded the mark together, these being Cobham on the D.H.50, Capt. Macmillan on the Fairey III.D, and Barnard on the second D.H.50. No other machines turned at Leith, thus leaving three to be accounted for—Courtney on the other "Siskin," King on the Martinsyde, and Biard on one of the Supermarine "Seagulls." Courtney, it appears, noticed something wrong with the running of the propeller when crossing the Humber, so he descended



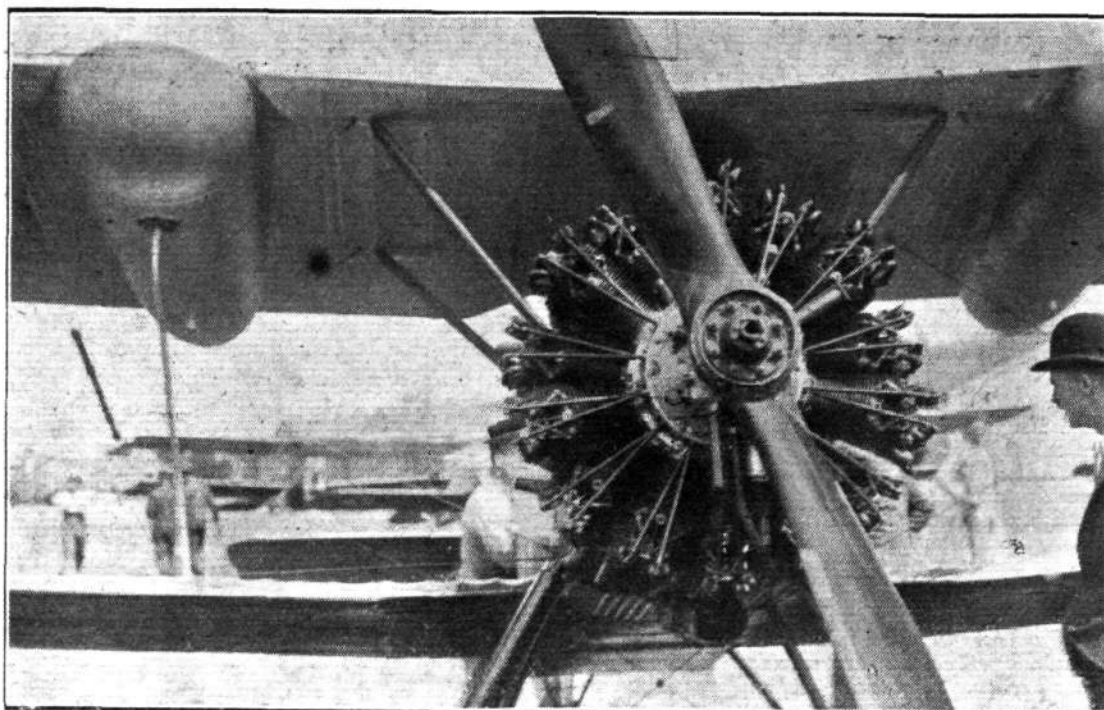
THE VICKERS "VIXEN": On the left Sqdn.-Ldr. Payn crossing the finishing line, fifth under the handicap, and, on the right, the "Vixen" taxiing in. Below: Sqdn.-Ldr. Payn and his passenger, Mr. J. Wyatt.



KING'S CUP MACHINES AT GOSPORT: Nearest the camera is the winning machine, Cobham's D.H.50 with "Siddeley-Puma" engine. Next to that is seen Mr. Alan Butler's D.H.37, Rolls-Royce "Falcon," which finished third, while on the extreme left is Sqdn.-Ldr. Payn's Vickers "Vixen," Napier "Lion."



At Gosport after the finish of the King's Cup Race: A group of contented de Havillanders. Left to right: Mr. C. C. Walker, Mrs. Cobham, Capt. de Havilland, Mr. A. J. Cobham, Mr. Wallace Barr, and Mr. Alan S. Butler.



The Armstrong-Whitworth "Siskin," piloted by Flight Lieut. Jones, made the fastest time. Our photo. shows one of the large petrol tanks, and the "Jaguar" engine.

at Brough, found that the spinner had broken and he was unable to proceed. King was landing at Town Moor, Newcastle, for petrol, when the undercarriage collapsed and further progress was out of the question. Biard, when near Newcastle, experienced a mishap—fortunately without injury to himself or passengers—the airscrew working loose and flying off on its own. He managed, however, to make a safe descent in a field near Blaydon.

Over the comparatively short section across Scotland to Dumbarton, the competitors encountered "thick" weather conditions. The first to round Dumbarton Castle was once again Jones on the "Siskin," at 8.16 a.m., and at 8.53 Butler came round on the D.H.37, having thus made good progress. Then, with one exception, the remaining competitors came round at minute intervals as follows: Macmillan (9.2), Payn (9.3), Barnard (9.4) and Cobham (9.5). The exception was the Master of Sempill, who passed at 10.17 a.m. Then came the long and somewhat difficult section to Falmouth. Over this section, while the visibility had greatly improved, a stiff westerly breeze had sprung up, which somewhat checked the speed of the machines. At Falmouth Jones on the "Siskin" was still leading when he rounded the Castle at 11.59 a.m., Payn following 17 minutes later. Butler came along next at 12.43 p.m., followed 10 minutes later by Macmillan on the Fairey III.D. At 1.13 p.m. Cobham arrived, going strong, but there was no sign of the Master of Sempill, and at first anxiety was felt for his safety. However, at 5.10 p.m. he was reported having rounded Falmouth on the way to Lee-on-Solent. It appears that a drift wire broke shortly after leaving Dumbarton, and he landed at Renfrew to put matters right, and was thus con-

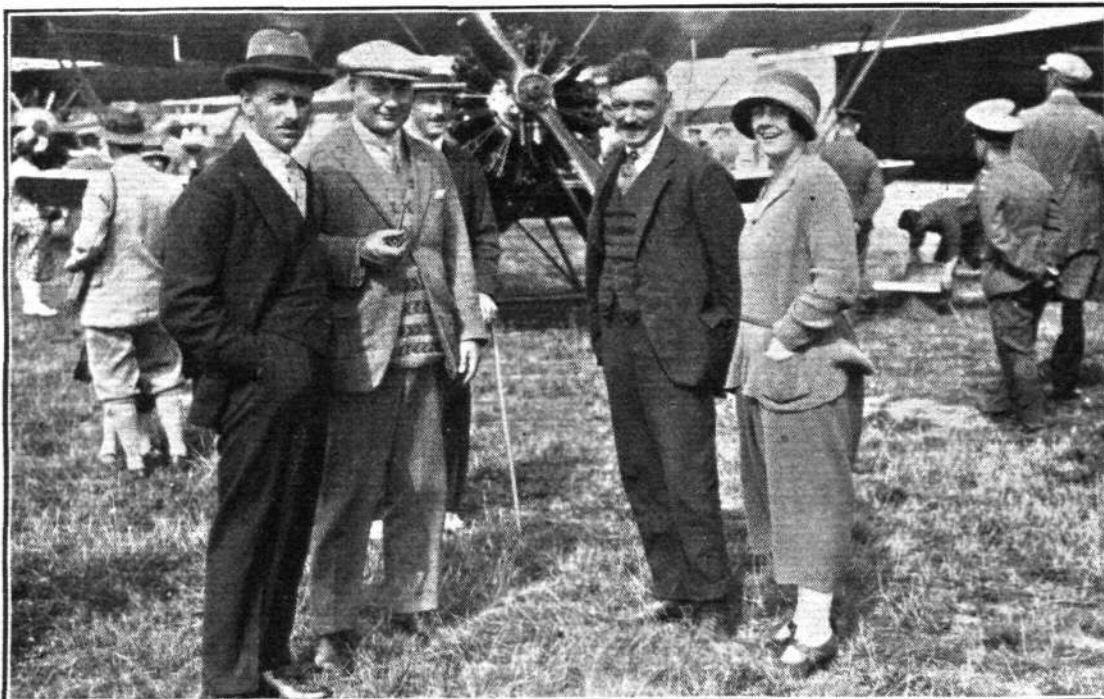
siderably delayed. He also landed at Anglesea and Padstow for petrol. Flight-Lieut. Jones landed at the Isle of Man for petrol, and this was the only stop he made throughout. Cobham landed at Ayr for petrol and oil, and nearly came to grief by running into a haycock. Barnard, who also landed at Ayr for fuel, collided with one of the haycocks and smashed his propeller and was thus put out of the race.

Macmillan landed at Stranraer Harbour for petrol. Alan Butler, who landed at Ayr for petrol, also nearly came to grief on account of the haycocks on the aerodrome.

The first man to cross the "line" in front of the pier at Lee-on-Solent was Jones on the "Siskin," and although not necessarily the winner he got a rousing reception. He finished officially at 1 hr. 5 min. 12 sec. o'clock. At 1 hr. 58 min. 48 sec., Butler arrived on the D.H.37. When Macmillan arrived "Home" at 2 hr. 15 min. 53 sec. the "slide-rule merchants" began to get busy, to ascertain the actual winner, for favourable reports of Cobham's progress had been received. As a matter of fact, Macmillan actually "arrived" at 2 hr. 6 min., but he did not cross the line in the official manner, and, in spite of frantic signals from his friends, landed. As soon as he was informed of his mistake, however, he took off once more and officially crossed the line as above. The fourth to arrive was Payn on the Vickers "Vixen," and he crossed the line at 2 hr. 26 min. 1 sec. Then at 2 hr. 33 min. 12 sec. came Cobham, and a rapid calculation proved him the winner.

After this there was a long wait for the one remaining competitor, the Master of Sempill, on the Supermarine "Seagull," but it was not until 6.38 p.m. that he at last arrived "Home," much to everyone's relief.

The King's Cup Race: At the Gosport aerodrome: Left to right, Lieut.-Col. Darby, Lieut. Col. Bristow Sqdn.-Ldr. H. J. Payn, and Mrs. Payn.



THE ROYAL AERO CLUB OF THE U.K.

OFFICIAL NOTICES TO MEMBERS

TWO-SEATER LIGHT AEROPLANE COMPETITION Notice to Competitors

The magneto will be included in the Schedule of Replacements permitted (Engine Parts).

The following entries have been received:—

- (1) The Bristol Aeroplane Co., Ltd.
- (2) The Bristol Aeroplane Co., Ltd.
- (3) The Bristol Aeroplane Co., Ltd.
- (4) Messrs. William Beardmore and Co., Ltd.
- (5) Westland Aircraft Works.
- (6) Westland Aircraft Works.
- (7) The Air Navigation and Engineering Co., Ltd.
- (8) Messrs. Short Bros., Ltd.
- (9) Supermarine Aviation Works, Ltd.

- (10) Messrs. A. V. Roe and Co., Ltd.
- (11) Messrs. A. V. Roe and Co., Ltd.
- (12) The Blackburn Aeroplane and Motor Co., Ltd.
- (13) Frank Ernest Raine.

Entries

The entry fee is £20. This fee, together with the entry form, must be received by the Royal Aero Club not later than August 22, 1924. Late entries will be received up to 12 noon on September 5, 1924. Late entry fee, £40.

Offices: **THE ROYAL AERO CLUB,**
3, CLIFFORD STREET, LONDON, W. 1.
H. E. PERRIN, Secretary

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of **FLIGHT**, who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.

Two official statements of more than ordinary interest are published in this week's issue of **FLIGHT**. One precedes these notes, and one follows after them. The former, published under the Official Notices of the Royal Aero Club, informs us that up to the present 13 light 'planes have been entered for the Lympne competitions. The latter is an announcement by the Air Ministry relating to the formation of light 'plane clubs throughout the British Isles.

From the Royal Aero Club announcement it will be seen that the Bristol Aeroplane Company has entered no less than three machines. What these are we are not yet permitted to state, but it goes without saying, of course, that they have been designed by Captain Barnwell, and, secondly, that they will be fitted with Bristol "Cherub" engines. Incidentally, we have heard, although not from the makers, that the new "Cherub" has now passed its type tests, and that it develops 32.6 b.h.p. at 3,200 r.p.m. These figures are given with reserve, as we have not the official figures relating to the type tests.

That Wm. Beardmore and Company were entering a machine was already known, and also the fact that it has been designed by Mr. W. S. Shackleton, whose very successful A.N.E.C. monoplane of last year will have another counterpart in the A.N.E.C. monoplane two-seater entered this year, and which Mr. Shackleton designed before leaving the Addlestone firm. It seems likely that there may be a good

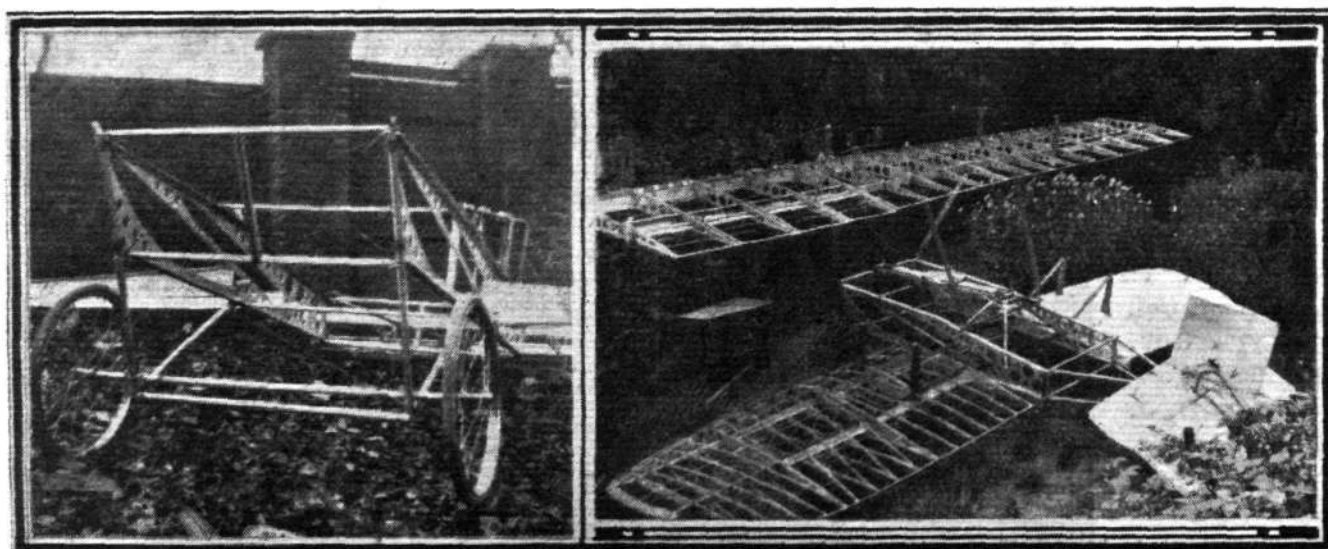
deal of similarity between the two machines, so that a comparison should be interesting.

Of the two machines entered by the Westland Aircraft Works we believe one is a biplane and the other a monoplane. Details are not available at present, but it may be taken for granted that the Yeovil firm will produce machines of no small interest, having shown in the past a willingness to undertake the design and construction of machines of somewhat unorthodox design.

The monoplane entered by Short Brothers has already been described and illustrated in **FLIGHT** (July 24, 1924). It is fitted with a Bristol "Cherub" engine, and is interesting on account of the all-metal monocoque fuselage, which is similar in construction to those of the Short "Silver Streak" and "Springbok" machines.

Of particular interest is the announcement that the Supermarine Aviation Works have entered a machine. With the exception of a few experimental land machines, including the famous P.B. "Seven-day bus," built in the early days of the firm, no aeroplane has been produced at Woolston, work there being confined entirely to flying boats. It will be of more than passing interest to see the sort of machine Mr. Mitchell turns out. That it will be a fine piece of work is scarcely to be doubted. Perhaps it will be a miniature "flying boat on wheels"!

After the splendid performance put up by Hinkler and Hamersley on the Avro machines last year, it was to be expected that there would be a couple of Avros again this year, and this proves to be the case. Whether they will be of different or of similar types we refrain from saying at the moment, but they are sure to be typical Avros, with good performance, excellent manoeuvrability and easy to handle.



A MAN-PROPELLED MACHINE: This biplane, designed and built by Mr. F. P. Fraper, of East Dulwich, has its top 'plane rigidly fixed, while the bottom 'plane "beats" the air when operated by the pilot.

THE Blackburn Aeroplane and Motor Company are making their entry in the light 'plane field, or perhaps it would be more correct to say re-entry, as this firm built some years ago a low-power monoplane with A.B.C. engine, known as the Blackburn "Sidecar." Nothing much was ever heard of this machine, although it was, we believe, exhibited at Harrods.

THAT several more machines will be entered is almost certain. For instance, we believe that George Parnall will be represented by one or possibly two machines of Mr. Harold Bolas' design. The excellent performance of last year's "Pixie" would seem to promise well for a two-seater version. Vickers, Ltd., are almost sure to enter a machine also, and it was rumoured some little time ago that the Hawker Engineering Company was building a machine for the competition. Altogether it seems fairly safe to assume that there will be in the neighbourhood of twenty machines at Lympne. It is greatly to be regretted that such well-known firms as the de Havilland Aircraft Company, Handley Page, Ltd., the Fairey Aviation Company, the Gloucestershire Aircraft Company and the English Electric Company will not be represented.

THE Air Ministry announcement relative to the formation of light 'plane clubs, given below, is of interest as the first official detailed statement to be made. It will be seen that the Air Ministry proposes to subsidise ten light 'plane clubs during the next two years, provided the clubs themselves put up financial contributions of an equivalent amount. We think it a mistake to insist that the clubs shall make their own financial arrangements for aerodrome facilities, although if the Air Ministry grants are sufficiently large it will, perhaps, be all the better to be away from too much official supervision. Otherwise the A.M. might have assisted very materially by lending the club's hangars and landing facilities free of charge.

LIGHT AEROPLANE FLYING CLUBS

THE Air Ministry announces that the Air Council have been greatly impressed with the aeronautical possibilities opened up by the development of the light aeroplane, in which this country leads the way, and in addition to offering prizes for a competition, open to two-seater light aeroplanes, which will be held at Lympne next month, they are anxious that full advantage should be secured to the country from the progress which is being made with this type of aircraft.

The Air Council have reached the conclusion that these advantages can best be secured by encouraging, with the help of county and municipal authorities, the formation of light aeroplane clubs throughout the country, and they are now prepared to assist financially, for a period of two years, the establishment of ten Light Aeroplane Flying Clubs whose constitution is approved.

In the first instance it is proposed to endeavour to secure the formation of such clubs in the leading commercial centres of the country, and an Air Ministry representative will shortly visit likely centres with a view to discussing the details of the scheme which has been prepared with the local authorities and hearing their views on the subject.

Under the scheme the Air Ministry proposes to make to each club an initial grant, suitably secured, for the provision of approved types of light aeroplanes selected by the club,

The decision to make a grant for each member qualifying for his (or her) licence is one to be commended, as it will tend to encourage the taking out of private pilot's licences. Altogether the announcement is encouraging, and if the financial and other assistance is really forthcoming there should be little difficulty in getting started.

MR. F. P. FRAPER, of 32, Belvoir Road, East Dulwich, London, S.E. 22, is anxious to secure the co-operation of someone interested in the construction of a man-propelled machine which he has started to build, but which he is now, mainly owing to lack of funds, unable to complete. The machine is illustrated herewith, and is a biplane in which the top plane is fixed, while the lower plane can be given a "beating" movement, as its spars work in guides in the fuselage sides. Mr. Fraper has been experimenting along these lines for several years, and he informs us that in comparative tests with rubber-driven models he got one incorporating the beating wing to fly three times as long as one with a propeller driven by exactly the same amount of rubber. That it will be possible to fly with "one man power" still remains to be proved, but, at any rate, Mr. Fraper seems to have proved that such a machine can be made to fly and be kept under control. When the lower wing is kept stationary the machine becomes, of course, a normal biplane glider.

THE *Tour de France des Avionnettes* having dwindled to a one-man affair, there is nothing to report except the fact that Drouhin, on his Farman monoplane with three-cylinder Anzani engine, successfully completed the circuit, and arrived at the Buc aerodrome on schedule time on August 10, having covered the entire circuit without mishap, in spite of extremely unfavourable weather conditions. At the moment it is not known whether he will be awarded all the prizes, or only the stage, etc., first prizes. In any case, he should be doing very well out of his fortnight's work.

AERONAUTICAL PRINTS AND DRAWINGS*

THERE are quite a number of people who are quite unaware of the fact that man's effort in aeronautics met with varying degrees of practical success as far back as 140 years ago, and that during the first half of this period a considerable number of free balloon flights were accomplished. Thus an illustrated record of these early attempts should prove to be of great interest to many, and such a record is now available in "Aeronautical Prints and Drawings," by Lieut.-Col. W. Lockwood Marsh.

Apart from the technical interest, however, this work is also of particular value as a record of some of the large number of interesting, and in many cases scarce, prints and engravings dealing with "aerostation" that were produced

during this early period. From the print collector's point of view, therefore, this volume should be particularly welcome. It contains some 87 reproductions—some in colour—of a selection of drawings and engravings depicting the chief aeronautical ascents and projects, together with a few portraits, which were a feature during the latter part of the eighteenth and the first half of the nineteenth century.

In addition to the plates—which are beautifully reproduced—Lieut.-Col. Lockwood Marsh gives an excellent and interesting survey on these early records of aeronautics, whilst there is a foreword by Major-General Sir Frederick H. Sykes. As Sir Frederick truly states in his foreword, "this book will be found to fill a real gap, not merely in aeronautics but, indeed, in the literature of art." The subject is one which has been entirely neglected in this country up to the present, and only covered to a very partial extent elsewhere.

* "Aeronautical Prints and Drawings," by Lieut.-Col. W. Lockwood Marsh, O.B.E., M.A., LL.B., published by Halton and Truscott-Smith, Ltd., Haymarket, S.W. 1. £3 3s.

PROGRESS OF CIVIL AVIATION

Annual Report on Period April 1, 1923, to March 31, 1924

ONCE more the Annual Report by Major-General Sir Sefton Brancker, Director of Civil Aviation, on the progress of civil aviation, has been issued. The present report, published as a White Paper (Command 2210) and obtainable at H.M. Stationery Office, price 1s. net, follows previous reports in all essential details, and shows that progress has been, if not rapid, at any rate steady. The report is of interest mainly for two reasons, the first of which is that it is the last report to deal with the four companies hitherto operating, and which have now been merged into the new "million pound monopoly company" known as Imperial Airways, Ltd. The second reason is that the report includes for the first time an account of investigations of civil aviation accidents under the Air Navigation (Investigation of Accidents) Regulations, 1922 (S.R. & O., 1922, No. 650). "It is considered," the introduction states, "that the publication of details of the work carried out by the Inspector of Accidents in conformity with these regulations is beneficial to the growth of an informed public opinion in regard to civil flying accidents, and such details are accordingly included."

The report is divided into two parts, of which Part I deals with British aviation in general and Part II with aviation in foreign countries. The various subheads under Part I are: Relations with foreign countries; Air Mails Committee; Imperial Airways, Ltd.; Commercial Air Services; Estimates; Air Navigation Regulations; Licences and Certificates; Airships; Training of Reserve Officers; Exhibitions, Competitions, etc.; Ground Organisation; Technical Services; Medical Services; Investigation of accidents to civil aircraft; Statistics of civil flying. This section of the report also gives a number of tables giving statistics of flights and passengers, goods, efficiency, causes of landings and accidents.

Space does not allow of a detailed reference to Part II, which deals with civil aviation in foreign countries, and those interested should obtain from the Stationery Office a copy of the report. It is stated that the countries which are now parties to the International Air Navigation Convention are: Belgium, Bolivia, Great Britain, Canada, Australia, South Africa, New Zealand, India, Bulgaria, Czechoslovakia, France, Greece, Italy, Japan, Persia, Portugal, the Kingdom of the Serbs, Croats and Slovenes, and Siam. Great Britain and Northern Ireland have entered into air traffic agreements with Denmark, Norway, Sweden, and Switzerland, and the agreement with Holland has been signed and is only awaiting ratification. The temporary agreement with Czechoslovakia expired on March 31, 1924, but it had not been found practicable to operate any services under this agreement, owing to the attitude adopted by the German government. Permission has been granted by Germany on a reciprocal basis, generally for a period of three months, enabling the operation of British air services to Cologne and Berlin. Reference is made to the interim report of the Air Mails Committee, which has already been dealt with in FLIGHT, and also to Imperial Airways, Ltd., which company undertakes to complete during the first four years an average minimum annual mileage of 1,000,000 miles on air services, and a minimum annual mileage in each of these years of 800,000 miles, and of 1,000,000 miles per annum afterwards until the subsidy of £1,000,000 shall have been repaid. Considerable detail information is given concerning the activities of the four operating companies which merged into one large company on April 1, but as this is mostly ancient history it is not proposed to give details here. What is of considerably more interest is the reference to various privately-owned, unsubsidised firms, who appear, according to the report, to have been doing most valuable work without any aid from the Government.

Thus it is stated that during the period under review the de Havilland Aeroplane Hire Service has carried out flights to practically every country in Europe, and flown a total of over 165,000 miles. The fleet of this firm has been increased from 8 machines to 15 machines. In addition reference is made to the new D.H. 50, which obtained first prize at Gothenburg last year, and which has since been doing other good work and made some excellent flights.

The Savage Sky-writing Company operated a fleet of 18 single-seater machines, and had a further nine machines under construction. The report points out that most of the work took place in the United States, where 2,250 hours' flying on actual sky-writing work was carried out.

By way of an example of the rapidity and economy of

aerial photographic surveying is quoted the survey of the Irrawaddy Delta by air. In the United Kingdom Aero Films, Ltd., have carried out over 120 hours' actual flying during aerial photographic work, and have added to their stock more than 10,000 general views. This company were officially appointed by the British Empire Exhibition to record periodically the progress of work on the exhibition buildings, and were also appointed official aerial photographers during Derby Day and Epsom race week, 1923.

The Central Aero-Photo Company have also made steady progress in the work of photographing factories, estates, etc.

Experiments in night flying were planned, but had to be abandoned owing to financial stringency.

Reference is also made to the Air Estimates, but these have already been fully dealt with in FLIGHT.

The section dealing with licences shows that during the period under review 63 new pilots' licences were issued, and 221 were renewed, the number current on March 31, 1924, being 135. It is interesting to note that 117 new aerodromes were licensed and the licence renewed for 17. The number of new aircraft registered was 113, and the number of new airworthiness certificates issued was 112.

On the training of Reserve officers the report states that of the four schools established, the de Havilland school trained 97 pupils, the Bristol school 70, the Beardmore school 48, and the Armstrong-Whitworth school 30, giving a total of 245 pupils trained at the four civilian schools.

A considerable amount of interesting information is contained in the section dealing with technical services. Thus the report states that two types of three-engined machines are under construction and two more in the design stage. Of the two former, one is the Handley Page W 8 F, while the other is an all-metal machine designed for long-distance flights, up to about 2,000 miles, on the Imperial air routes. The two experimental three-engined types in the design stage will both be constructed, in the first instance, of wood. As they are being designed to a specification for machines suitable for transport in the Middle East, later types can be built in metal, should the experimental types prove successful. One of these machines will be fitted with three Bristol "Jupiter" engines, and the other with three Siddeley "Jaguar" engines. Two new experimental single-engined types, suitable for cross-Channel services, are also under construction. One will be fitted with a Rolls-Royce "Condor," and the other with a Bristol "Jupiter." It is stated that one of these machines will be fitted with a Handley Page slotted wing, and the other with the de Havilland automatic flap gear.

The Supermarine twin-engined amphibian has been successfully flown, and will shortly be put into commission. A seaplane of special type, intended for long-distance flights, is being produced by the Fairey Aviation Company. Fitted with a Rolls-Royce "Condor," it will carry a crew of five, and will have a range of about 1,700 miles in still air.

On the subject of aero engines, it is interesting to find the statement that "Particular attention has been paid during the year to the construction of engines with cylinders fitted with sleeve valves, especially with a view to obtaining greater reliability and obtaining engines more suitable for civil aviation. Two complete engines of 450 h.p., incorporating this feature, are now under construction." Considerable advance has been made with the compression-ignition engine using heavy oil.

Half-scale tests of the "Leader Cable" device for landing in fog carried out at the Royal Aircraft Establishment have given promising results. Among aircraft instruments which have been undergoing tests, the Sperry, Reid, and Shilovsky type turn indicators have been found to give good results.

Investigation of Accidents

Apart from trivial occurrences not calling for special investigation, a total of 26 accidents occurred during the year ending March 31, 1924. Six accidents resulted in the loss of life, but only one of these involved passengers, the other five having occurred during "solo" flights for the purpose of test, competition or private flying. With the exception of the one fatal accident, which occurred on an established air route, no persons carried in an aircraft registered in the British Islands and flying for hire or reward was injured to any serious extent. Out of the total of 26 accidents a broad classification indicates that 13 were due to an error of judgment on the part of the pilot, 2 to defect in aircraft structure

or controls, 8 to defects in engine or installation, 1 to weather conditions, and 2 to other causes. Of the 13 accidents ascribed to an error of judgment on the part of the pilot, 2 occurred on the air routes, none in the hire services, 6 on short passenger flights, 1 during a competition, 1 at a school, and 1 in a "private enterprise."

Statistics of Civil Flying

During the past year the total air transport flying amounted to 1,004,000 miles flown in 5,012 flights, as against 778,000 miles in 4,000 flights in the previous year. Passengers carried in the course of these flights numbered 15,013 (as against 11,460 in the previous year), and goods carried totalled 427 tons (as against 216 tons). These figures are all the more satisfactory in view of the fact that the Hambling Committee's report, which was published in February, 1923, recommended the winding up of the existing air transport companies. Its publication lessened the intensive effort brought to bear on obtaining fresh traffic.

Other flying (mainly "joy riding") amounted to 120,000 miles flown and 39,227 passengers carried (as against 109,000 and 25,253 respectively).

British companies received a still larger proportion of the total passenger traffic on the cross-Channel aeroplane routes. The British share during the past year was 79 per cent., as compared with 76 per cent. in the previous year. It is satisfactory to note that this increase was not the result of a proportionately greater number of flights, the British flights remaining at the previous year's figure of 58 per cent.

Imports and exports by air during the year reached a value of £883,233, bringing the total from August, 1919, up to £3,410,242. It should be borne in mind that the annual

increase in goods traffic is less marked when the value of goods is considered than it is when the weight is taken as a basis, since the heavy traffic in newspapers is unrepresented in the former case, and, further, the general freight being carried today is not confined to light and valuable merchandise, but includes many large consignments of a bulky nature.

An indication of the efficiency of British air transport is given in a table, wherein it is shown that at present the average efficiency of the British services is about 91 per cent. in the summer months, 82 per cent. in the winter months and 88 per cent. for the whole year. A flight is regarded as "efficient" if completed within the time limit allowed under the subsidy scheme from the scheduled time of departure.

That the average rate of 88 per cent. is lower than the figure of 92 per cent. previously recorded for the London-Paris route alone is attributed to the greater distances flown and the shorter operating experience on the London-Cologne and London-Berlin routes.

The causes of involuntary landings on the regular services are analysed. An average of 9 per cent. of the flights commenced were interrupted through various causes. Of these interruptions, more than 60 per cent. were due to weather and about 25 per cent. to mechanical defects, interruptions caused by weather varying from about 50 per cent. in the summer months to about 70 per cent. in the winter months.

Table F shows the accident rates for civil aviation. During the year under review one fatal accident occurred in air transport flying on regular services, and one non-fatal accident, in which no passenger was injured, occurred in "other flying for hire." The fatal accident recorded is the first which has taken place since 1920 involving loss of life to passengers travelling on the regular air routes.



THE DEPARTMENT OF AERONAUTICS, IMPERIAL COLLEGE, SOUTH KENSINGTON

THE following particulars relating to the Department of Aeronautics of the Imperial College of Science and Technology, South Kensington, may be of interest. The department is composed of the following:—

Zaharoff Professor of Aviation and Director of the Department—Leonard Bairstow, C.B.E., F.R.S., A.R.C.S. Assistant Professors:—Design and Superintendent of the Drawing Office—F. T. Hill, A.F.R.Ae.S., M.I.Ae.E.; Lecturer on Airships—V. C. Richmond, O.B.E., B.Sc., A.R.C.S., A.F.R.Ae.S.; Lecturer on Air Navigation and Instruments—H. E. Wimperis, O.B.E., M.A., F.R.Ae.S., M.I.E.E.; Lecturer on Strength of Structures—W. S. Farren, M.B.E., M.A.; Lecturers on Engine Design—H. Moss, D.Sc., A.R.C.S., D.I.C.; W. J. Stern, B.Sc., A.R.C.S., D.I.C.

The department was established in 1920-21 to give effect to the scheme proposed by the Committee on Education and Research in Aeronautics in their report, dated December 12, 1919, in which the opinion was expressed that "the Imperial College should become the central school for advanced study in aeronautical science." The report described the organisation by which this should be done, and in accordance with its recommendations, which were approved by the Government, funds have been placed at the disposal of the college for the purpose.

The school is administered by an Advisory Committee, which reports to the Executive Committee for the college. It consists of 12 members, Mr. Herbert Wright being chairman; the members represent the Imperial College, the Air Ministry, the Aeronautical Research Committee, the University of Cambridge, the Royal Aeronautical Society, and the Society of British Aircraft Constructors.

The functions of the staff of the school are classified by the Committee under four distinct but closely related heads:—(a) To study, co-ordinate, summarise, apply, and extend the experimental work carried out by individual workers at various experimental stations in this country and abroad. (b) To stimulate research by indicating what information is most urgently required, and what line of attack is likely to prove most profitable. (c) To guide and encourage research by constructive criticism, based on a careful study of past and current work in this country and abroad. (d) To impart this knowledge by personal teaching to a limited number of post-graduate students.

The school is, in the main, a post-graduate one. A course of complete study will ordinarily last over two years, the first of these being passed, in the main, at the college. During

the second, arrangements will be made wherever possible for research and experimental work.

In addition to the organised courses of the school there will be opportunity for research in aeronautics by qualified students.

A course of advanced study (Course B of the Air Ministry Orders, No. 336), lasting over one year, has been arranged for those who cannot give two years to the complete course. Students taking this course ordinarily spend two terms at the college and one term (subject to permission) at a research station or at the National Physical Laboratory.

The following is a syllabus of the course:—

I.—Design and Engineering.

(1) *Aerodynamics*, by Prof. Bairstow.—(a) Lectures are given twice weekly, followed by class work. The lectures include:—Fluid motion theory and experiment. Steady motion of aircraft; elementary treatment. General treatment of design data. Airscrew theory. Prediction of aircraft performance. Stability and control.

(b) *Mathematics for Students of Aerodynamics*.—Lectures, arranged in conjunction with the Department of Mathematics.

(2) *Design Lectures*.—Followed by a class, twice weekly, by Assistant Professor Hill, with Drawing Office work under Professor Bairstow and Assistant Professor Hill at times to be arranged.

The lectures and Drawing Office work in Aircraft Design will be conducted as far as possible on a system such as is used in a present-day aeroplane designer's office. A typical machine will be divided up into a number of components, and the design of individual parts making up those components discussed from the point of view of the use of particular materials, structural strength, ease of manufacture, interchangeability of spare parts, etc. The design of suitable jigs for the manufacture of such fittings will also be dealt with. The mechanical detail of various types of modern aeroplanes will be examined and the particular points in each designer's specialities discussed.

(3) *Materials of Aircraft Construction*.—Lectures with class work, by Assistant Professor Hill, once a week. The lectures include:—Consideration of the materials used in aircraft construction from the designer's and constructor's point of view. Steels, steel tubes, streamline wires and swaged rods, steel wire ropes and cables; aluminium and its alloys; copper and tin alloys; timber and glue; rubber; fabric coverings. Mechanical testing of materials necessary to investigate properties peculiar to aircraft requirements;

applications of proof stress, fatigue range, Brinell, Izod, bend and reverse bend tests. Protection of materials against atmospheric and other deteriorating effects.

(4) *Construction and Strength of Aircraft*.—Lectures by Mr. Farren, twice weekly, followed by class work, laboratory experiments and Drawing Office, under Mr. Farren and Assistant Professor Hill. The Lectures include:—The loads on an aeroplane in flight and their distribution in the structure; manœuvres and extreme conditions. Load factor and factor of safety. Materials and specification of strength. Wing structures; types; spar and strut design; fittings. Fuselages, undercarriages, and control surfaces. Redundancy in aeroplane structures. The treatment of structures in three dimensions. The relative importance of weight and head resistance in structural parts. Metal and composite construction in aircraft.

The class work includes:—Numerical examples on the lectures. The calculation of the strength of a typical aeroplane (wing structure and fuselage) in detail.

The Drawing Office work includes:—The design of spars, struts, and details for the aeroplane dealt with in the class work.

(5) *Engine Design*.—Lectures, twice weekly, with Laboratory Work by Dr. Moss and Mr. Stern, and Drawing Office under Assistant Professor Hill, followed by class work and Drawing Office under the Lecturers and Assistant Professor Hill. The lectures include:—Essential features of a heat cycle; practical limitations; the piston engine; heat and work balance; avoidable and unavoidable losses; engine accessories; carburettor; ignition system; fuel system; the effect of altitude. Typical aircraft engines. Lines of future development. The injection engine. Light alloys and their application. Torque curves of stationary and rotary engines; Inertia forces; Forces on connecting-rod, crank pin, crankshaft, cylinder walls; Torsional vibrations; Balance. Properties of fuels; Mixture strength; Volumetric efficiency; Measurement of fuel and air; Measurement of I.H.P., B.H.P., and frictional losses.

(6) *Airships*.—Lectures by Mr. Richmond, once a week, with class work and Drawing Office. The lectures include:—Aerostatics. The resistance of airships and the manner in which it is affected by their form. The aerodynamical forces acting on an airship in straight or curved flight and the characteristics which result. The loading of airships. Types of non-rigid and semi-rigid airships. Airship fabrics and the manufacture of envelopes and gasbags. The propulsion of airships. Stresses in non-rigid airships. General description of the hull structure of rigid airships and the

methods of calculation the stresses set up therein. Generalised methods for calculating primary stresses in rigid hulls. The design of redundant frameworks. The consideration of some secondary stresses in the hull structure.

(7) *Air Navigation and Instruments*.—Eight lectures on Air Navigation and Instruments, by Mr. Wimperis. A course of about 20 lectures, with practical instructions and class work, by Mr. Wimperis.

Students entering for this course are expected to have sufficient knowledge of Mathematics.

(8) *Mathematics*.—Classes in Mathematics will be arranged. Students who complete this course satisfactorily can pass on to a course of Aeronautical Research. (Course C of Air Ministry Order, No. 336.)

II. METEOROLOGY.

By the Assistant Professor and other members of the Staff:—

(1) An introductory general course on the structure of the atmosphere and the meteorology of the globe.

(2) Short technical courses of about four lectures each on one or more special subjects, as meteorological organisation, the practice of observing, the practice of forecasting, special local conditions, cloud layers, the bearing of meteorology on the practice of aerial navigation, terrestrial magnetism, etc.

(3) A course of about 20 lectures with class work and practical work on dynamical and physical meteorology.

(4) Meteorological research.

For the Session 1924-25 the following are the courses:—

(1) Introductory General Course, first half-Session.

(2) Discussions of the Incidents of the Weather Charts of the previous week, Tuesdays at 10.15 a.m. during term time.

(3) Technical Courses, Spring Term:—

(a) Meteorological Optics.

(b) Radiation.

(4) Advanced Meteorology, Dynamical and Physical, once a week during the winter and spring terms.

(5) Meteorological Research by arrangement.

(6) Meetings for discussion of Recent Contributions to Meteorological Literature. Alternate Mondays during term time at 5 p.m., beginning Monday, October 20th, 1924.

Students in the Meteorological Division will be expected to have a knowledge of Dynamics, including Elementary Rigid Dynamics and Hydraulics, and of certain branches of Physics—the gaseous laws, specific heat, latent heat and the rudiments of the thermodynamics of gases, vapours and mixtures.

Courses of instruction for R.A.F. Officers detailed for special service will be arranged as occasion requires.



Another Round Australia Flight

THREE Australian Air Officials, Colonel Brinsmead (Controller of Civil Aviation), Captain Jones (Superintendent of Flying Operations), and Mr. Buchanan, a civil aircraft inspector, left Point Cooke (near Melbourne) on August 7, on an attempt to fly around Australia.

Busk Studentship in Aeronautics

THE trustees of this studentship, founded in memory of Edward Teshmaker Busk, who lost his life in 1914 while flying an experimental aeroplane, have appointed Mr. John Cowan Stevenson, of Glasgow University, to the vacant studentship.

A Correction

AN unfortunate error crept into the advertisement of Messrs. C. C. Wakefield ("Castrol") which appeared in our last issue of FLIGHT, in which the winner of the 1922 King's Cup was given as Capt. C. F. Barnard. This, of course, should have read "F. L. Barnard." We offer as an excuse the fact that there are two Barnards—both well-known pilots—and the mixing up of the two initials passed unnoticed in the rush of going to press.

Prizes for Italian National and International Aviation Records

THE Italian Higher Committee for Aeronautics has decided to award the sum of 300,000 lire for records, either Italian or international, put up by Italian pilots before December 31 next.

Swedish Air Mail Services

ACCORDING to the Department of Overseas Trade, the Florman brothers have concluded an agreement with the Finnish Postal Administration for the conveyance of Finnish mails on the Helsingfors-Stockholm air line. This agreement followed by a similar contract with the Swedish Government. The regular service commenced operations on June 23 last,

and on July 2 last the Florman Company started a service between Malmö and Hamburg.

The French Dewoitine Company Active

WHILE extending the works at Toulouse the Dewoitine Company is erecting a factory for new aircraft types at Chatillon-sous-Bagneux, near Paris. A new transport machine is being erected in temporary sheds, and is expected to make its first appearance towards the end of this summer. This machine is a thick-wing monoplane, with a 420 h.p. engine, and it will have a range of about 800 km. (500 miles), with a commercial load of at least 600 kgs. (1,320 lbs.).

Breguet Machines for Serbia

THE Serbian aviation authorities recently placed an order with the Breguet Company for 100 Breguet type XIX machines. Demonstrations with this type of machine were carried out by M. Thierry at Novisad aerodrome, in the presence of numerous Serbian military aviation officials.

Amsterdam-Batavia Flight

FOLLOWING the example of France in sending Lieut. D'Oisy on an aerial dash to the Far East, Holland is proposing to send a pilot from Amsterdam to Batavia, Java. Plans for this flight, which will probably start on October 1, are already in hand. Heer van der Hoop, one of the K.L.M. commercial pilots, will make the attempt on a Fokker F.VII, fitted with a 360 h.p. Rolls-Royce "Eagle," which is employed on the London-Amsterdam service. This machine will be withdrawn from its commercial service in September next, and will then be overhauled, fitted with new engine and reserve petrol tank, ready for the big flight. The route to be followed, which totals some 15,000 miles, will include Prague, Belgrade, Constantinople, Angora, Aleppo, Baghdad, Bushire, Runder Abbas, Charbar, Karachi, Multan, Ambala, Allahabad, Calcutta, Akyab, Rangoon, Bangkok, Singora, Medan, Padang, and Batavia.

NOTE ON THE METHOD OF EMPLOYMENT OF THE AIR ARM IN IRAQ

THE following note, signed by Lord Thomson, presented to Parliament, has now been issued by the Air Ministry :—

1. It should in the first place be appreciated that defiance of the administration in Iraq and resultant disorder are in by far the great majority of cases dealt with by police action alone. It is only when this fails, or it is judged that the resources of the police will be inadequate for a particular situation, that any appeal for assistance is made to the Air Officer Commanding.

2. The Air Officer Commanding (who exercises operational control over all the military forces in the country) in such cases considers which are the best means of assisting the Government to procure obedience to its orders. His policy is to make continuously increasing use of the Iraqi Government's own forces. On other occasions Native Levies (which are partly officered by British regular officers) are employed, and, where conditions are suitable, armoured cars in co-operation with local forces have been used and have restored without bloodshed situations which would otherwise have inevitably resulted in serious disturbances with their attendant loss of life. These different ground forces are known to have the air arm behind them in cases of need, and this knowledge is a powerful factor for peace. Air action, however, is only used in the last resort, and no air operations are in any circumstances initiated except at the request of the local British civil adviser acting in concert with the local Iraqi Administration, and after that request has been considered and approved in succession (a) by the Minister of the Interior in the Iraqi Government and his British adviser, and (b) by the High Commissioner.

3. The Air Officer Commanding in scrutinising any request for the employment of the air arm makes full use of the rapid means of transportation which aircraft afford. In this way personal consultation is secured between local British advisers and intelligence officers and the political and air authorities at Baghdad.

4. This may be illustrated by reference to some operations undertaken in November, 1923. The Iraqi Governor of a Liwa (*i.e.*, an administrative area) on the Euphrates and his British adviser had decided that a certain district most inaccessible by reason of its close intersection by water channels and because of the entire absence of any track suitable for wheels or even moderately convenient for pack animals was definitely out of hand and could not be brought under administration by peaceful methods. It was a district which even before the establishment of an Arab kingdom had given considerable trouble to the Turkish authorities, which had remained untouched by and intolerant of government since the insurrection in 1920, and in which in consequence inter-tribal fighting and forays against more peaceable districts, with extensive resultant loss of life and damage to property, were of frequent occurrence.

5. The Government decided that this state of affairs could not continue, and that, for the protection of the neighbouring tribes, and in the interests of the peaceful development of the country, order must be enforced in this turbulent district.

6. The local British Adviser being of the opinion that force would be required, advised the Minister of the Interior to this effect. After consideration there, the problem was forwarded to the High Commissioner, who in turn asked the Air Officer Commanding to prepare such measures as would be suitable for dealing with the district if the expectation of continued defiance proved to be realised.

7. The next step was for the High Commissioner himself to proceed to the Government Headquarters concerned and to confer there with the local officials. Special service officers with a knowledge of local conditions, together with the Iraqi Governor of the district, his British Adviser, the local Commandant of Police and the British Police Inspector of the Area, were also taken by air to Baghdad for consultation with the Air Officer Commanding, who himself also made a reconnaissance of the whole district from the air at a low altitude.

8. The recalcitrant chiefs were formally summoned to the Provincial Headquarters, and were warned that severe measures would be taken if the summons was not obeyed. As they refused to come in, bombing was then authorised, and took place over a period of two days. The surrender of many of the headmen of the offending tribes followed, and a force of mounted police was enabled to enter the area and destroy a large number of the forts, the existence of

which had led inevitably to the continual unrest and fighting described above.

9. The alternatives to the employment of the air arm in backward countries of poor communications and with a wide scattered population are, firstly, an occupation by ground forces so complete as to put out of the minds of disaffected elements any hope or temptation to resist Government authority. Occupation on this scale would involve large numbers of troops and heavy expenditure. It is relevant to mention that after the rising in 1920 a fully-equipped infantry division of Imperial troops had been unable effectively to control the area in which the air action referred to in paragraph 8 above took place.

The second alternative is the maintenance of strong ground garrisons in particular centres from which columns of adequate strength can be sent out to lawless areas. Ground forces operating under these conditions in backward countries are notoriously confronted with many difficulties. They have to struggle towards their objectives through difficult country. The line of their march spreads the area of disturbance. The necessity of preparation for an expedition in itself spreads the flame of unrest and assists all the disaffected elements to rally to each other. The process of restoring order by ground expeditions often requires long lines of communication which are themselves liable to attack or may involve, as a protection against concentration in the rear of the column, destruction of entire villages and confiscation of livestock. In any case the sum of casualties both to the tribesmen and to the troops and followers of the column is normally considerable.

10. The employment of the air arm in lieu of ground forces provides a method of control more effective and less costly in life and suffering. Air action can be taken swiftly at the focus of trouble and before the disturbance against which it is directed has time to permeate a larger area. It has the immense advantage that compared with the slow movements of ground forces over unfamiliar country it offers to the tribesmen no chance of loot or retaliation by ambush or concentrations against small ground forces.

11. Other considerations which it is important to realise are that :—

(1) In many cases where the air arm is employed the despatch of a few machines to disturbed districts suffices to secure submission to the Government without any necessity for actual offensive action from the air, though the efficacy of warning patrols of this kind obviously rests upon the recognition by recalcitrant tribesmen of the fact that stronger measures are in reserve.

(2) Bombing is only resorted to in answer to open and armed defiance persisted in after warning of the consequences of defiance has been given and explicit notice issued that air action will be taken unless submission is yielded. The effect of these notices is that the tribes are enabled in many cases to withdraw from the area concerned, and the compulsion exercised by the use of the air arm rests more on the damage to morale and on the interruption to the normal life of the tribes than upon the number of actual casualties, which, for the reasons explained above, fall below what would be caused by ground expeditions in the same circumstances.

(3) Apart from the military aspects of its employment, the ubiquity of the air arm serves as a constant reminder over wide-spread areas of the existence of the Government of the country, and this in itself has a tranquillising effect. In this connection the following extract from the recently published Report on Iraq Administration (Colonial No. 4, June, 1924) is of interest :—

"... The effectiveness of air control would be only partially considered if mention was omitted of its value as a threat and as a means to close co-ordination and co-operation of administrative effort over an immense area ill-provided with other means of communication. An aeroplane or formation of aeroplanes, either employed for the purpose or on some administrative duty, can be seen in the air by a widely-spread population and provides an effective reminder to many of the existence and power of Government.

"Without air transport the niceties of administration and military touch are impossible with other existing means of travel in Iraq, and perhaps the greatest achievement of Air Control in Iraq during the six months under review has been the introduction of this inestimable asset. By its means it has been possible to achieve a highly centralised yet widely understanding intelligence which is the essence of wise and economical control."

PROGRESS IN THE BIG FLIGHTS

Round-the-World Flights

WITH Squad.-Ldr. MacLaren "out of the race," so to speak, and the Americans with their task all but completed, the greater share of interest in the Big Flights now centres round the new aspirant for the honour to be the first to fly round the world—Major Pedro Zani of the Argentine Air Service. Major Zani, it will be remembered, accompanied by his mechanic Beltrame, left Amsterdam on July 26, flying a Fokker C.IV. (Napier Lion) biplane, and on August 5 he had got as far as Nasirabad, having thus covered some 5,500 miles in 11 days.

On Wednesday, August 6, he continued his journey and arrived at Allahabad at 9 o'clock in the morning. In resuming his flight early next morning he met with a slight mishap in taking off. Owing to recent rains the ground was rather soft and the wheels sank to such an extent that the propeller struck the earth and was smashed. Fortunately, a spare propeller was available, but this caused some considerable delay, and it was not until 9.30 a.m. that he was able to make a start for Calcutta.

A large crowd of officials and spectators awaited his arrival at the Dumdum Aerodrome, Calcutta, but they waited in vain, for neither man and machine nor news of his whereabouts reached the aerodrome up to a late hour that night. On the following afternoon (August 8), however, Major Zani turned up safe and sound at Calcutta. He stated that he had to make a forced descent at Isri (Bikar), 200 miles or so from Calcutta, having encountered thick fog, which compelled him to descend to within about 30 ft. of the ground before he could find a suitable landing place.

He remained in the machine throughout the night, with a large crowd of Indians surrounding him. It is reported that certain adjustments have to be made to the machine, and a new propeller obtained, before Major Zani will be able to continue his flight to Akyab.

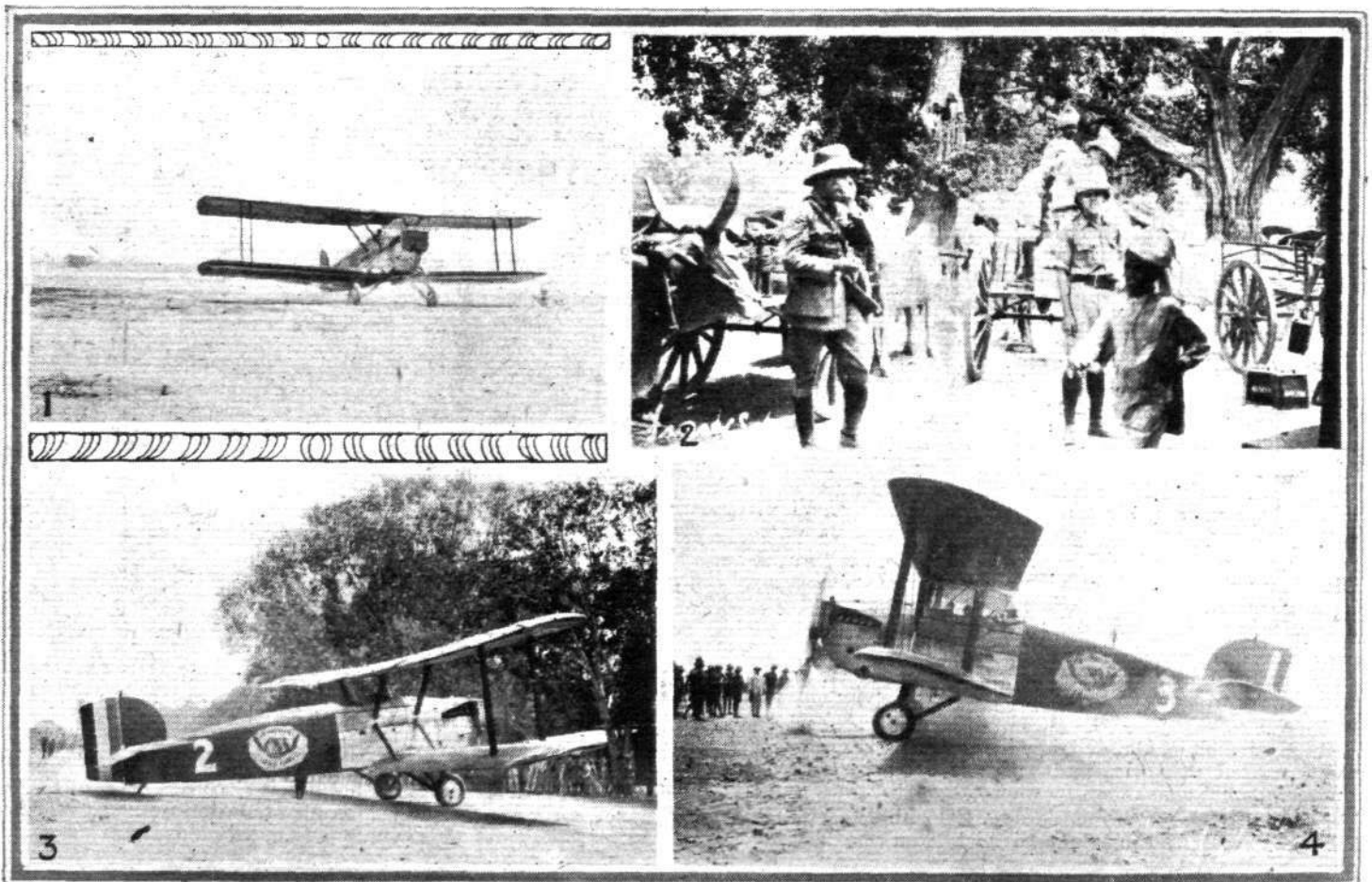
The following telegram was received in London by Shell-Mex, Ltd., from Major Zani, in Calcutta:—"My thanks to Shell for fine organisation of fuel and oil supplies. Quality

and purity of Shell aviation spirit and super-Shell oil uniformly excellent."

In the meantime the remaining American World-Flyers, Lieuts. Lowell Smith and Nelson, with their companions, Lieuts. L. P. Arnold and J. Harding, are still hung up at Reykjavik, Iceland, awaiting suitable conditions around Greenland for the landing there. Unfortunately, as time goes on matters appear to be getting worse rather than improving—the ice conditions off Greenland being very bad just now. On Friday last, Admiral Magruder held a conference on the "Richmond," when it was decided to make a final effort to find a safe landing-place on the east coast of Greenland before making any decision as to whether or not the remainder of the flight should be postponed. The U.S. cruiser "Raleigh," therefore, set forth with the object of ascertaining how matters stood along this section of the route, and to find a landing place as free from ice as possible.

Lieut. Smith stated that he did not at all like the idea of refuelling at sea from the "Raleigh." It was suggested that it might be possible to fly direct to Ivigtut near Cape Farewell, a distance of 780 miles. The steamer "Gertrude Rask," which had proceeded to Greenland to make preparations for the American flyers, got caught in an ice-pack on the way to Angmagsalik, and a trawler, the "Kara" had to be sent from Reykjavik, with fresh supplies of coal. In short, conditions are by no means promising for the successful completion of the American World Flight.

As regards the other big flights, Sig. A. Locatelli, the Italian airman, who is following in the wake of the American World Flyers on a Dornier mono-seaplane, left Brough, Hull, on Saturday, and reached Houton Bay in 4½ hours—1½ hours less than the Americans took to complete the same journey. Locatelli landed in the Holm of Houton—a somewhat dangerous point—and, but for the help of a motor-boat, would have drifted ashore. Shortly after, he proceeded to Stromness Harbour, from which place he intended to start on the Iceland trip on the first favourable opportunity.



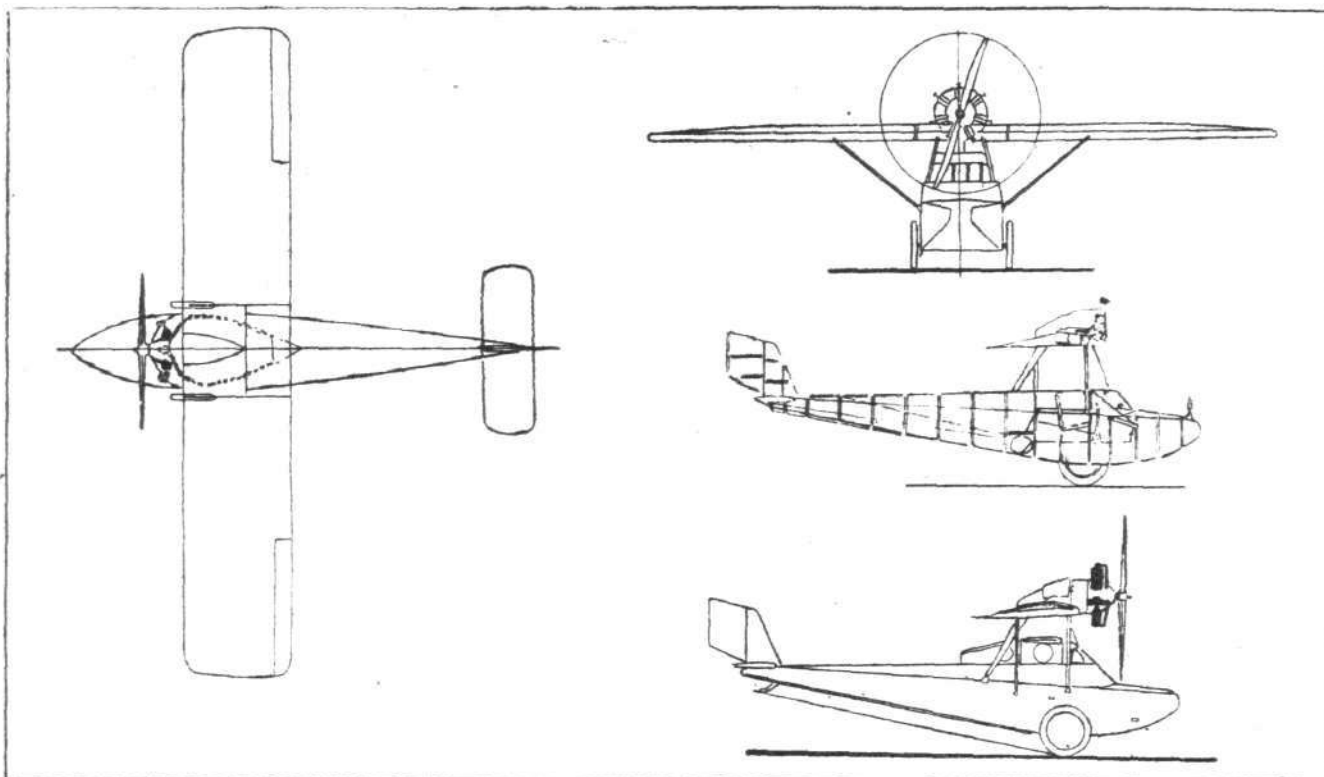
THE AMERICAN WORLD-FLYERS IN INDIA: We have received the above "snaps" from Sergt. V. R. Fraser, who is stationed at Multan, one of the stopping-places on the American World-Flight. (1) No. 2 Douglas World-Cruiser taxiing on the "aerodrome" at Multan, July 3. (2) Unloading petrol and oil for the American machines (note the native method of transport). (3) No. 2 machine, "Chicago," at rest after its arrival. (4) No. 3 machine arriving at Multan, July 3. All three machines departed early next morning for Karachi.

A FLYING BOAT ON WHEELS

The "Dornier Sparrow"

AMONG the lower-powered types produced by Dornier-Metallbauten G.M.B.H., of Friedrichshafen, the "Dragonfly" (*Libelle*) is already familiar to readers of *FLIGHT*. One of these machines was exhibited at Gothenburg last year, when it was fully described. The "Dragonfly" is, of course, a flying boat of low power, carrying two passengers in addition to the pilot. The Dornier Co. has now introduced a very

form of duralumin members of various sections. Owing to the resemblance to the "Dragonfly" no detailed description of the "Sparrow" appears necessary. Following are, however, the main characteristics: Length over-all, 6.9 m. (22 ft. 7 ins.); span, 9.8 m. (32 ft. 2 ins.); height, 2.8 m. (9 ft. 2 ins.); wing area, 14.2 sq. m. (153 sq. ft.). Weight empty, 445 kg. (980 lbs.); useful load, 275 kg. (605 lbs.);



similar type, known as the "Sparrow" (*Spatz*), for use as a school machine. The "Sparrow" is, however, an aeroplane, and so far as can be ascertained is merely the "Dragonfly" with wheels substituted for the small wing roots which in the flying boat type give lateral stability on the water.

As in the case of the "Dragonfly" the construction is entirely metallic, even to the covering. Highly-stressed parts are made of steel, while the rest of the structure is in the

total loaded weight, 720 kg. (1,585 lbs.). Power loading, 20 lbs./h.p.; wing loading, 10.35 lbs./sq. ft. Maximum speed at sea level, 141 km./hour (87½ m.p.h.); cruising speed, 120 km./hour (74½ m.p.h.). Petrol consumption, 18 kg. (39.6 lbs.) per hour. Ceiling, 3,500 m. (11,500 ft.).

The engine is a Siemens seven-cylinder radial air-cooled of about 80 h.p., mounted above the wing and driving a tractor screw.

THE ROYAL AIR FORCE

London Gazette, August 5, 1924

General Duties Branch

C. E. Galpin is granted a short service commn. as a Pilot Offr. on probation, with effect from and with seny. of July 29. The following are granted temp. commns. as Flying Offrs. on attachment to R.A.F. for four years (July 14):—Capt. A. B. F. Alcock, D.S.C., R.M.; Lieut. F. M. R. Stephenson, R.N. The following Pilot Offrs. are promoted to rank of Flying Offr.:—N. H. F. Unwin; June 13. C. W. A. Scott; July 9. Flying Offr. C. W. H. Moller is placed on half pay, Scale B; Aug. 1. Flying Offr. F. C. Baker is transferred to the

Reserve, Class C; Aug. 1. Flying Offr. W. E. P. Saunders (Lieut., I.A., ret'd.) resigns his short service commn.; Aug. 6. The short service commn. of Pilot Offr. on probation W. J. Lewis is terminated on cessation of duty; Aug. 6.

Reserve of Air Force Officers

J. Woods is granted a commn. in Class A, General Duties Branch, as a Pilot Offr. on probation; July 22 (substituted for *Gazette*, July 22). Pilot Offr. A. Lewis is transferred from Class A to Class C; July 25. The commn. of Flying Offr. on probation W. C. Harveyson is terminated on cessation of duty; Aug. 5.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the R.A.F. are notified:—

General Duties Branch

Wing Commanders: J. C. Quinell, D.F.C., to No. 7 Group H.Q., Andover, for Air Staff duties. 12.8.24. T. R. Cave-Browne-Cave, C.B.E., to remain at R.A.F. Depot, instead of to No. 1 Sch. of Tech. Training (Boys), Halton, as previously notified.

Squadron Leaders: G. H. Bowman, D.S.O., M.C., D.F.C., to No. 5 Flying Training Sch., Sealand. 18.8.24. G. B. A. Baker, M.C., to No. 2 Flying Training Sch., Digby. 23.8.24. R. H. G. Neville, M.C., to No. 29 Sqdn., Duxford. 12.8.24.

Flight Lieutenants.—M. A. Simpson, to No. 99 Sqdn., Bircham Newton. 17.8.24. R. A. George, M.C., to Boys' Wing, Cranwell. 9.8.24. R. Harrison, D.F.C., to No. 2 Flying Training Sch., Digby. 12.8.24. E. G. Hilton, D.F.C., A.F.C., to Aeroplane Experimental Estab. No. 22 Sqdn., Martlesham Heath. 14.8.24. J. C. Foden, A.F.C., to No. 58 Sqdn., Worthy Down, on transfer to Home Estab. 31.7.24. H. J. Edgar, to R.A.F. Depot. 13.8.24. E. H. Richardson, to No. 5 Flying Training Sch., Sealand. 11.8.24. C. N. Ellen, D.F.C., to R.A.F. Base, Leuchars. 25.8.24. G. A. H. Pidcock and E. D. Davis, both to Armament and Gunnery Sch., Eastchurch. 18.8.24. H. V. Pendavis, D.S.O., to Sch. of Photography, S. Farnborough. 5.8.24. R. St. H. Clarke, A.F.C., to Armament and Gunnery Sch., Eastchurch. 18.8.24. K. H. Riversdale-Elliott, to R.A.F. Depot, on transfer to Home Estab. 1.8.24. A. S. G. Lee, M.C., to No. 1 Group H.Q., Kidbrooke. 15.7.24.

Flying Officers: H. G. P. Ovenden, to No. 207 Sqdn., Eastchurch. 25.8.24.

G. H. Russell, D.F.C., to Sch. of Photography, S. Farnborough. 5.8.24. C. N. H. Bilney, to Armament and Gunnery Sch., Eastchurch. 18.8.24. P. R. Cawdell, to Aircraft Depot, Iraq. 12.7.24. R. A. King, to No. 4 Flying Training Sch., Egypt, on appointment to a Temporary Commn., on being seconded from the Army. 29.7.24. H. E. V. Carroll and J. A. Stedman, to No. 5 Flying Training Sch., Sealand. 14.8.24. R. E. B. Rose, to R.A.F. Base, Calshot, on transfer to Home Estab. 4.8.24. C. C. Harris, to No. 4 Flying Training Sch., on appointment to a Temporary Commn., on being seconded from the Army. 1.8.24.

Pilot Officer: C. E. Galpin, to No. 2 Flying Training Sch., Digby, on appointment to a Short Service Commn. 29.7.24. B. F. H. Harding, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 22.7.24.

Stores Branch

Squadron Leader: J. S. Goggin, to H.Q., Palestine. 1.2.24. **Flight Lieutenants:** W. Rollinson, to R.A.F. Depot (Non-effective Pool), on transfer to Home Estab. 22.7.24. E. D. Galloway, to H.Q., Inland Area. 8.8.24.

Flying Officers: E. G. Keeping, to Inland Area Aircraft Depot, Henlow. 9.8.24. W. H. Harrison, to No. 29 Sqdn., Duxford. 9.8.24. S. R. L. Poole, to remain at No. 1 Stores Depot, Kidbrooke, instead of to No. 29 Sqdn., Duxford, as previously notified. J. L. Armstrong (Accountant), to H.Q., Accountant Office, Iraq. 5.5.24.

Pilot Officer: R. G. A. Vallance, to No. 4 Stores Depot, Ruislip, instead of to Inland Area Aircraft Depot as previously notified.

SOCIETY OF MODEL AERONAUTICAL ENGINEERS

A GENERAL records day was held at the Sudbury ground on August 10 under ideal weather conditions. Messrs. Hersom and Johnson were flying fuselage machines, Mr. Green and Mr. Hersom, jun., fuselage gliders, and Mr. Langley numerous feather planes.

Mr. Green made several attempts at beating the fuselage glider record (of 40 $\frac{3}{4}$ secs.), and finally succeeded in doing so by putting up a flight of 48 $\frac{3}{4}$ secs.

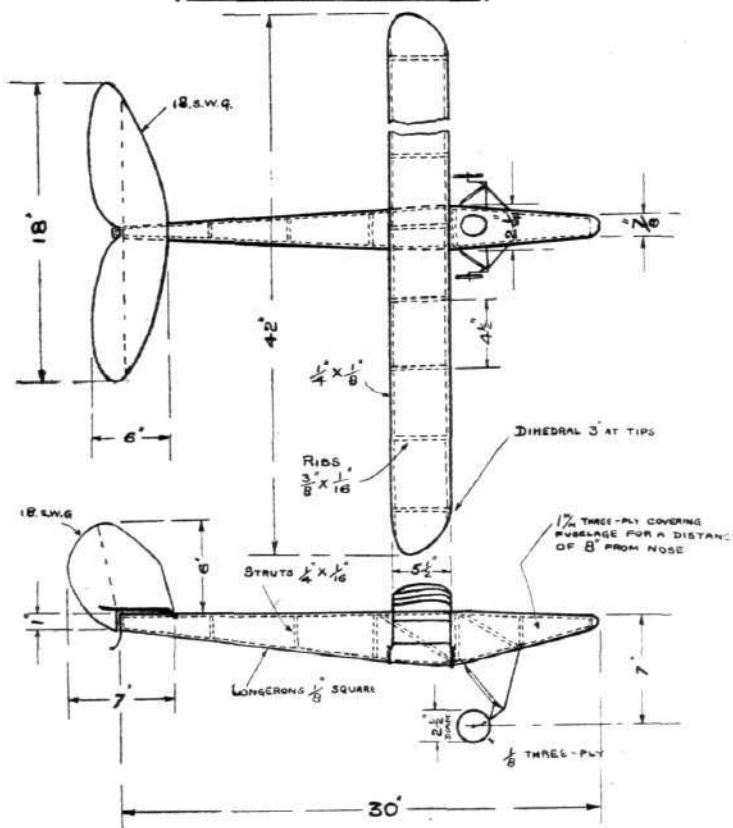
B. K. JOHNSON,
Technical Secretary

C. W. HOWSE'S FUSELAGE GLIDER

THE model monoplane glider shown in the accompanying drawing has a built-up fuselage, in which respect it differs from the types illustrated previously in FLIGHT. This machine has been found to give good and consistent results, and has stood up well to much hard usage. Although the "duration" (officially timed) is only 19 seconds, many glides of considerably longer duration have been obtained.

The fuselage is of rectangular cross-section, built up of $\frac{1}{8}$ in. square longerons and $\frac{1}{8}$ by $\frac{1}{16}$ in. cross- and diagonal-

C.W.HOWSE'S FUSELAGE GLIDER.
(DRAWINGS BY B.K.JOHNSON.)



Plan and elevation of C. W. Howse's Fuselage Glider.

struts. It is covered with 1 mm. three-ply for a distance of 8 ins. from the nose. The wings are built up of wood— $\frac{1}{2}$ by $\frac{1}{2}$ in. leading and trailing edges, and $\frac{1}{8}$ by $\frac{1}{16}$ in. ribs—and have a 3-in. dihedral at the tips. They are mounted on the top of the fuselage saddle fashion, being secured by elastic passing under the fuselage. The tail plane and rudder are built up of 18 s.w.g. wire. Fore and aft balance is obtained by a lead weight in the nose—roughly about 1 $\frac{1}{2}$ ozs., the exact weight being found by experiment.

The principal characteristics of this glider are:—

Span	..	..	..	3 ft. 6 ins.
Chord	..	..	..	5 $\frac{1}{2}$ ins.
O.A. length	..	..	..	2 ft. 6 ins.
Area of main plane	..	..	..	230 sq. ins.
Area of tail plane	..	..	..	80 sq. ins.
Area of fin-rudder	..	..	..	36 sq. ins.
Total weight	..	..	..	12 $\frac{1}{2}$ ozs.
Loading per sq. ft.	..	..	..	7 $\frac{1}{2}$ ozs.

IN PARLIAMENT

Air Ministry

SIR F. SYKES on August 6 asked the Under-Secretary of State for Air the number and total emoluments of higher division staff employed at the Air Ministry in the secretarial, finance, accounting, and contract departments, respectively?

Mr. Leach: The accounting and contract departments of the Air Ministry are organised on an executive basis. As regards the secretariat and finance divisions, the number of higher division staff is 20 and 15 respectively, with total emoluments of £18,678 and £15,336 respectively, but in addition there are seven officials whose services are divided amongst both secretariat and finance divisions and whose emoluments amount to £11,674.

PUBLICATIONS RECEIVED

Commissariato dell'Aeronautica. Notiziario di Aeronautica No. 7.—Direzione Superiore del Genio e delle Costruzioni Aeronautiche, Viale Giulio Cesare, Rome. Price L. 50.

Department of Overseas Trade Report on the Industrial and Economic Conditions in Norway, to March, 1924.—By C. L. Paus. H.M. Stationery Office, Kingsway, W.C. Price 2s. net.

Department of Overseas Trade. Report on the Industries and Commerce of Spain, March, 1924. By Capt. U. de B. Charles, C.B.E. London: H.M. Stationery Office, Kingsway, W.C. Price 2s. 6d. net.

Pioneers.—The British Petroleum Co., Ltd., Britannic House, Moorgate, London, E.C.2.

U.S. National Advisory Committee for Aeronautics: Reports No. 181. The Influence on the Form of a Wooden Beam on Its Stiffness and Strength, II: Form Factors of Beams Subjected to Transverse Loading Only. By J. A. Newlin and G. W. Trayer. No. 185: The Resistance of Spheres in Wind Tunnels and in Air. By D. L. Bacon and E. G. Reid. No. 186: The Application of Propeller Test Data to Design and Performance Calculations. By W. S. Diehl. *Technical Notes: No. 193:* High Altitude Flying. By P. B. King and T. Carroll. No. 194: A Method of Determining the Dimensions and Horse-power of an Airship for any Given Performance. By C. P. Burgess; May, 1924. No. 195: On the Distribution of Lift Along the Span of an Airfoil with Displaced Ailerons. By Max M. Munk. June, 1924. No. 196: Remarks on the Pressure Distribution over the Surface of an Ellipsoid, Moving Through a Perfect Fluid. By Max M. Munk; June, 1924. No. 197: Some Tables of the Factor of Apparent Additional Mass. By Max M. Munk; July, 1924. U.S. National Advisory Committee for Aeronautics, Washington, D.C., U.S.A.

Catalogue

The Source of Correct Illumination. The Benjamin Electric, Ltd., Brantwood Works, Tariff Road, Tottenham, N.17.

AERONAUTICAL PATENT SPECIFICATIONS

Abbreviations: Cyl. = cylinder; i.c. = internal combustion; m. = motor. The numbers in brackets are those under which the Specifications will be printed and abridged, etc.

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